

June 11, 1981

## GLASAIR NEWS

## THE 150 HP PROTOTYPE

Our new prototype has an N number of 89SH. It has approximately 40 hours on it at the time of this writing. Performance figures have been established at two horsepower ratings, 150 hp and 160 hp.

We recently converted our 150 hp engine to 160 hp by installing higher compression pistons and pins, giving increased fuel economy and performance.

As you will notice on the enclosed photograph of the new production prototype, the canopy height has been changed (about 3" higher). We like the "looks" much better as we think you'll agree. Also included on the new prototype is a completely faired tailwheel, internal elevator counterweights, much improved visibility, improved cowling design (better cooling and manifold pressure), better roll rate, improved flap mechanism, much better canopy system, tuned exhaust, etc. These are all included in the kit except the tuned exhaust, which will be offered later as a kit option.

With the 150 hp engine, top speed was 225 mph with a cruise of 217 to 219 mph at 75% power at 8,000 ft. Climb rates at sea level averaged around 1600 ft/min. With the engine at 160 hp, top speed is 231 mph with a cruise speed of 225 mph at 75% power at 8,000 ft. In addition, the average rate of climb increased 150 ft/min.

The airplane has an empty weight of 920 lbs. with some more upholstery yet to be installed (remember, we have radios and a full gyro set-up). Gross weight has been reestablished at 1500 lbs.

The exhaust header is working well but is quite loud, A muffler of some sort is being developed.

Fuel consumption figures at 8,000 ft. are 9.5 gal/hr at 225 mph, and 6.8 gal/hr at 190 mph with the 160 hp engine. At the high-



er altitudes better economy can certainly be expected.

Stall speed is 59 mph with full flaps, and approach speeds are about 70 mph. The power off stall on 89SH is gentle with very slight forward stick movement to recover. All in all, we are extremely pleased with the airplane.

### **PRODUCTION SCHEDULES AND KIT PRICING**

The Glasair production delivery has recently been right on schedule (in some cases, sooner than the builder expected), provided you don't live in Sweden! At this time you can expect delivery time estimations to be fairly accurate.

We are planning a price increase to be effective August 1, 1981 of \$700. The price increase covers our increased cost on materials only. It is hoped that this price will be in effect for one year, as we have been able to hold our current price of \$7,500 for one year. This means that all kits delivered from August 1981 on will pay the increased-price. In summary, the new total kit price, effective August 1, 1981, will be \$8,200.00, plus a \$400.00 crating charge, plus appropriate C.O.D. shipping charges. (Additional information regarding the price increase is on page 7 of the Newsletter.)

### **ENGINE TALK**

There has certainly been much talk on the issue of economy when using the larger engines (150hp,160hp) vs. the smaller ones (115hp,125hp). There is no question in anyone's mind that the higher compression engines have better fuel efficiency.

The specific fuel consumption (lb/bhp/hr) figures comply. The fuel is used more efficiently when the combustion mixture is compressed a bit more. The low compression engines have a 7:1 ratio and the high compression engines have a 8.5:1 ratio. This is the difference between the 150 hp and 160 hp engines. The fuel consumption is about 11% less for the 160 hp higher compression engine. So, when looking for an engine, keep this in mind.

We are trying an experiment with our engine because of the conversion to a 160 hp by replacing the pistons and the pins. Since we have the newer valves, 1/2" #74541, we know that they



will not pose a problem. The cylinders are plain, being neither chromed nor nitrided. The chromed and nitrided cylinders have harder surfaces for wear resistance. This surface treatment is only for the steel cylinder walls and does not affect the cylinder head which is made of aluminum. The only problems Lycoming has encountered are cracks in the cylinder heads extending from valve seats or spark plug holes. Since the heads are the same on both models, we don't foresee any fatigue problems over what would be normal for either the chromed or nitrided cylinders. The only question is the amount of increased wear to be encountered with the engine being high compression. We don't feel it is that much of a factor. Certainly if one wants to he can have his cylinders chromed. Another factor to consider when changing compression is the E2D style engine. It has the split style front main bearing and has thinner bearing thicknesses, yet the same bearing surface area. So a question may be whether a thinner bearing has less strength even though it has the same surface area. Lycoming says the thinner bearings could work just fine. Lycoming has not run certification tests with the engine at 160 hp, and so are unable to take a position at the present time.

We happen to know a pilot running a 10:1 compression ratio in the E2D and he hasn't encountered any problems. Also, with a wood propeller, the front crankshaft bearing loads are minimized because of the dampening effects of wood, and the lower dynamic loads with a wood prop in comparison to a metal prop. We are not saying that this is what you should do with your 0-320 low compression engine, but we are explaining why we have made the change; a change that requires a very minimal cost increase between low and high compression pistons and pins. The pistons should be replaced anyway on overhaul so it is just the cost of the thicker wrist pins. The gas price difference between 80 and 100 octane gas doesn't match the fuel savings, and 80 octane is becoming harder to find all the time. The weight difference is about 3 pounds for 10 extra horsepower. Not too bad!

Now, with regard to the efficiency of the larger engines. The increased size pays off in fuel economy at the higher cruise speeds. If the plane is flown slower than 170 mph, the smaller engines are more efficient. But cruising above this speed the larger engines will burn less fuel, as compared to the smaller engines. For example, say you want to cruise at 190 mph at 8,000 ft. This requires about 58% power in the Glasair with a 160 hp engine; 92.8 hp is required. The plane burns close to

6.8 gal/hr at this power setting. Using an 0-235 L2C to produce 92.8 hp requires a fuel consumption of 7.7 gal/hr. We find that almost everywhere we go we cruise above 170 mph, usually around 200 mph when at altitude. Also, when you need that extra horsepower it's nice to have it available; for example in a high density altitude take-off situation. At this point the extra fuel burned is well worth it. It's nice to have the extra horsepower and not need it, than need it and not have it!

If you have the desire to rebuild an 0-320 engine yourself and you want to get the great prices that Superior Air Parts offer, it can best be accomplished through your local repair station. The problem is that Superior Air Parts will sell only to manufacturers, engine exchange shops, or repair stations. So, ask your local aircraft mechanic if he can order the parts for you using his repair station number. Superior Air Parts, Inc. is located in Addison, Texas (zip code 75001). Telephone number is (214) 233-4433. Hopefully your mechanic will not tack on too much of a price for placing the order.

When we rebuild an engine we are sure to put in the following. All other parts are dependent on their condition.

PARTS TO REPLACE

Bearings - crankshaft main & front  
Bearings - rods  
Connecting rod bolts & nuts  
Pistons  
Piston rings  
Crankshaft plug  
Exhaust valves (#74541) and keys  
Valve springs (both inside & out)  
Camshaft (or reconditioned one)  
Tach shaft seal  
Front seal  
Complete overhaul gasket kit

TO REPLACE AS NEEDED

Tach shaft assembly  
Tach drive pin & retainer ring  
Rod bushings



TO REPLACE AS NEEDED, CONT.

Wrist pins, Piston pins  
Tappet body & plunger  
Oil relief ball & spring  
Oil pump drive impellers  
Oil pump shaft  
Valve guides and seats  
Oil drain hose  
Anything else that is out of spec.

Be sure if you are going to rebuild an engine that you get together with a competent A&P but try to do most of the work yourself. Also, get both a Lycoming overhaul manual, and a parts list. It's fun! Have all parts cleaned, magnefluxed or zyglowed, by someone who has the facilities. Check all dimensions to tolerances. Have the valves seated and guides checked and replaced if necessary by someone who has the proper equipment. While he has your cylinders, let him hone them so the new rings will seat. It's important that the crank case be separated by someone who has the proper tool. Be sure the nut behind the camshaft gear is removed.

As far as suppliers of first-run-out engines go, we feel it is better not to give out a list as we haven't dealt with them all, and feel it is better for you to hunt around yourself. The only people we have dealt with are in our local area. It would probably be better to acquire an engine locally to reduce shipping costs and substantiate the history of the engine.

We use the 68-74' 40 amp Toyota Corolla alternator. The part no. is 14129. We mate it up with a Lucas voltage regulator, part no. D42910.

PROPELLERS

The prop that we have settled on has a 68" diameter and 73" pitch, with the pitch measured off the flat on the back. If the pitch was measured through the chord of the blade it would

be 5" or 6" more. This is for the 160 hp engine. With the 150 hp use 1" less in pitch or the same if your plans include doing any further clean-ups. Also, there is a urethane rubber leading edge offered by some which enables the wood prop to be flown with high power settings through heavy rain.

#### SUPPLEMENTAL PACKAGES

The supplemental packages have taken time to gather together.

Antenna items can be obtained directly from Skyway Service Co., Jim Slauson, at 7014 So. 129th Pl., Seattle, WA, 98178. Antenna prices are \$15.00 each, or \$25.00 total for both COM and NAV antennas. Other antenna options are also available from Jim.

Packages that are offered by Stoddard-Hamilton Aircraft, Inc. are listed below. All items are available now, except where noted. To obtain the items listed written requests must be made to Jim Holman, Supervisor of Purchasing and Shipping, c/o our production Facility. The address is 19006 72nd Ave. S. Kent, WA, 98031. Jim's telephone number, just for your information, is (206) 251-5395. Hours are from 7:00 A.M. until 5:00 P.M. Jim will ship the items via UPS C.O.D.

<u>SUPPLEMENTAL PACKAGES</u>	<u>PRICE</u>
• 5X5:00 Axles and back up rings	\$35 per side
• 4" propeller extensions & lugs, S.A.E. -2, lug diameter of 5/8" (available in August)	\$110
• 5X5:00 Cleveland wheels & brakes (not available until September '81)	\$230 per pair
• A-049 Gerdes Master brake cylinders, or Cleveland Master brake cylinders (not available until September '81)	\$30 each
• Wing tip lenses (available by August '81)	\$30 per set
• Exhaust (not available at present, price to be announced)	

### INSTRUCTION MANUAL

At the time of this writing, the Instruction Manual is complete through the rudder assembly. All that remains is to complete the final assembly section and a couple of appendix sections. This section, however, is substantial, being in excess of 100 printed pages. There have been several factors that have resulted in the delay of the completed manual. We now anticipate delivery of the completed manual sometime in the fall of this year.

Again, we have found builder input very valuable and welcome comments, corrections, etc. Correspondence is best done by mail. Thank you in that regard. If something is critically important, our telephone number is (206) 432-0724. Thank you for your patience in waiting for the completed manual.

### GENERAL INFORMATION

We are presently doing further flight testing with 89SH. Also, we are putting together an airframe strictly for static load testing. This airplane will be loaded to the design ultimate loads in all respects as best as we can simulate actual flight loads. This will also tell us about the use of constant speeds in the future. Testing completed at this time on both prototypes has been wing loading (ultimate loads positive, limit loads negative), engine pull test (positive to limit loads), and landing gear drop tests per FAR, part 23. Limit loads are plus 6 G's, and minus 4 G's at 1350 pounds aerobatic weight. Ultimate loads are plus 9 G's and minus 6 G's at 1350 pounds aerobatic weight.

### ADDITIONAL PRICE INCREASE INFORMATION

This Newsletter is your official notice of a Glasair aircraft kit price increase. Deposits will be refunded, should cancellation be desired due to the price increase, provided a written request is submitted and postmarked no later than

July 10, 1981. Of course, if your delivery date is prior to August 1, 1981, the price increase does not affect you (actual delivery date).

KEEP IN TOUCH, AND HAPPY FLYING!

STODDARD-HAMILTON AIRCRAFT, INC.